Appendix K

Donald Smith Company, Inc. (DSC) Well Proposal

Donald Smith Company, Inc.

746 East Main Street • Headland, Alabama 36345 • (334) 693-2969 • Fax (334) 693-3089

December 16, 2019

Mr. Mark Tanner P.G.
TTL, Inc.
3516 Greensboro Avenue
Tuscaloosa, AL 35401

Re: New Production Wells

Dear Mr. Tanner:

We appreciate the opportunity to provide you with a quote for the 2 new water wells and pumping equipment for Twin Pines Minerals Facility. We have attached a breakdown of the services to be provided by Donald Smith Company. The following will be covered under the quoted price:

DESCRIPTION

Installation of (2) 650' open bottom limestone water wells with 12" steel casing and (2) new 75 HP oil lubricated lineshaft turbine pumps set to 180' and capable of producing 600 GPM at up to 300 ft of total hydraulic head.

(Please note that we cannot guarantee the quantity of water, we can only get the amount of water the aquifer will yield.)

<u>Well Construction:</u> The wells shall be installed by the rotary-hydraulic process. All casing shall be installed to such depth as the formations encountered may justify and, in the Contractor's opinion, best meet the conditions. These wells are designed as an open bottom wells with no screens, and it is normal for some open bottom wells to pump small amounts of sand. We have constructed general wells in this formation for commercial use that have not pumped enough sand to require screens and do not expect it to be a problem but cannot guarantee this. If screens are required there will be additional cost to the owner.

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BRANCH
P.O. Box 38
Shannon, MS 38868
Phone: (662) 767-9777
Fax: (662) 767-3107

Mobilization and Set Up: Donald Smith Company is of the understanding that we will be drilling on sites in close proximity to established dirt roads. There have been no provisions for set up in remote access sites that require the use of heavy equipment to traverse wet or muddy conditions. We are prepared for muddy or wet conditions on site, however, getting into these sites has been predicated on stable ground up to the site boundary. Donald Smith is also assuming that a properly sized lot will be obtainable, or that nearby extra space will be available for storage of unused equipment. Shallow 4" supply water wells (100'in depth) will need to be placed temporarily for make-up water during drilling and can be abandoned upon completion of the production wells.

Casing: An 18" pit casing will also be installed and grouted in place to protect the borehole from upper sand units washing out and collapsing during the mud rotary process. The main casing will be 12" x .250 wall and shall be installed from two (2) feet above present ground surface to a depth of +/- 475 feet below present ground surface into the top of the Ocala limestone unit of the Floridan aquifer. Casing shall be grouted via Halliburton method from bottom to top.

Development and Testing: After installation of the casing and grouting of annulus has been completed, the limestone formation shall be drilled to +/- 650' with air in lieu of drilling mud with an 11 7/8" bit. Drilling with air will allow for DSC to have a good feel for volume exiting the hole during the drilling process and the hole will be stopped once removal volumes indicate yields in excess of 1000 GPM

Pumping Equipment: A 75 HP, 3 phase, 480 volt, motor and oil lubed turbine pump with 8" column pipe assemblies to deliver approximately +/- 600 GPM @ 300' of total dynamic head is projected and included by this proposal. Estimated pump setting is 180'.

Start-up: Donald Smith will provide technician(s) to clutch up motors and go through start up procedures once process piping and electrical equipment have been installed and are ready for running.

Exclusions; All electrical equipment and process piping will be provided by owner. Donald Smith Company will provide 3' square concrete pump pedestals, approximately 18-24" above ground level, but the extent of the contract will stop at the flange of the pump discharge head.

Material Warranty: Contractor warrants all workmanship and material entering into the construction of the water well herein set forth against inherent defects and agrees to replace any part or parts which may prove defective within one (1) year from completion of installation. This warranty does not include lightning damage, acts of God, or equipment abuse.

Grand Total: $634,248

(This price is not based on the amount of water the well produces, it is the cost associated with drilling the well and is due regardless of the quantity of water the formation will yield.)

- **Outer Casing depth adjustment feet shall be $40.00 per foot**
- **Total depth adjustment shall be an additional $30.00 per foot**
- **Adjustment in the number of wells installed will require price modifications and will not be equal to 1/3 of current contract price.**
- **No cost for additional safety training requirements have been provided at this time as requirements are unknown. Any extra training will be added cost**

During the time of the project, we would like for a partial payment schedule to be in place. Our terms are as follows: 15% at mobilization, 20% after the completion of each well, 25% balance to be paid after the turbine pumps have been set in all 2 wells.

Again, Donald Smith Company would like to thank you for this opportunity to be of service to you. We look forward to hearing from you concerning this important project. If you have any questions concerning this proposal, please do not hesitate to contact me at 334-693-2969 or on my cellular phone at 334-796-0145.

Sincerely,

DONALD SMITH COMPANY, INC.
Eli Bundrick
Donald Smith Company, Inc.
746 East Main Street
Headland, AL 36345

In agreement this ________day of __________, 2019.

[signature]
Eli Bundrick, Project Manager

____
Owner/ Representative Contractor

HEAVY EQUIPMENT RENTALS, SALES, PARTS AND SERVICE

[+1-705-566-8190](tel:+17055668190) sales@bmcdowell.com

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Gould Pump - 11CLC

11CLC

Telephone: +1-705-566-8190
Fax: +1-705-566-6680

Ask about this product Print

Manufacturer: Gould

Asset Number: B95-548

BRAND NEW!!

Date 3/12

Size 3STG/IMP 7.13

6" ID

Overall Length - 250"

Curve Number: E6211CFPC1

Pump Data Sheet - Turbine 60 Hz

Company: Donald Smith Company
Name: Matt Singletary
Date: 03/23/2022

Customer:

GOULDS WATER TECHNOLOGY a xylem brand

Pump:

Size:	11CLC (stages: 5)	Dimensions:	
Type:	Lineshaft	Suction:	---
Synch Speed:	1800 rpm	Discharge:	---
Dia:	8.125 in	Vertical Turbine:	
Curve:	E6412CCPC3	Eye Area:	
		Bowl Size:	11 in
		Max Lateral:	0.88 in
		Thrust K Factor:	7 lb/ft

Search Criteria:

Flow:	600 US gpm	Near Miss:	---
Head:	300 ft	Static Head:	0 ft

Pump Selection Warnings:

None

Fluid:

Name:	Water		
SG:	1	Vapor Pressure:	0.256 psi a
Density:	62.4 lb/ft³	Atm Pressure:	14.7 psi a
Viscosity:	1.1 cP		
Temperature:	60 °F	Margin Ratio:	1

Pump Limits:

Temperature:	---	Sphere Size:	0.88 in
Wkg Pressure:	---		

Motor:

Standard:	NEMA	Size:	60 hp
Enclosure:	WPI	Speed:	1800 rpm
Frame:	364		
Sizing Criteria:	Max Power on Design Curve		

--- Duty Point ---

Flow:	600 US gpm
Head:	306 ft
Eff:	85.3%
Power:	54.3 hp
NPSHr:	8.14 ft
Speed:	1770 rpm

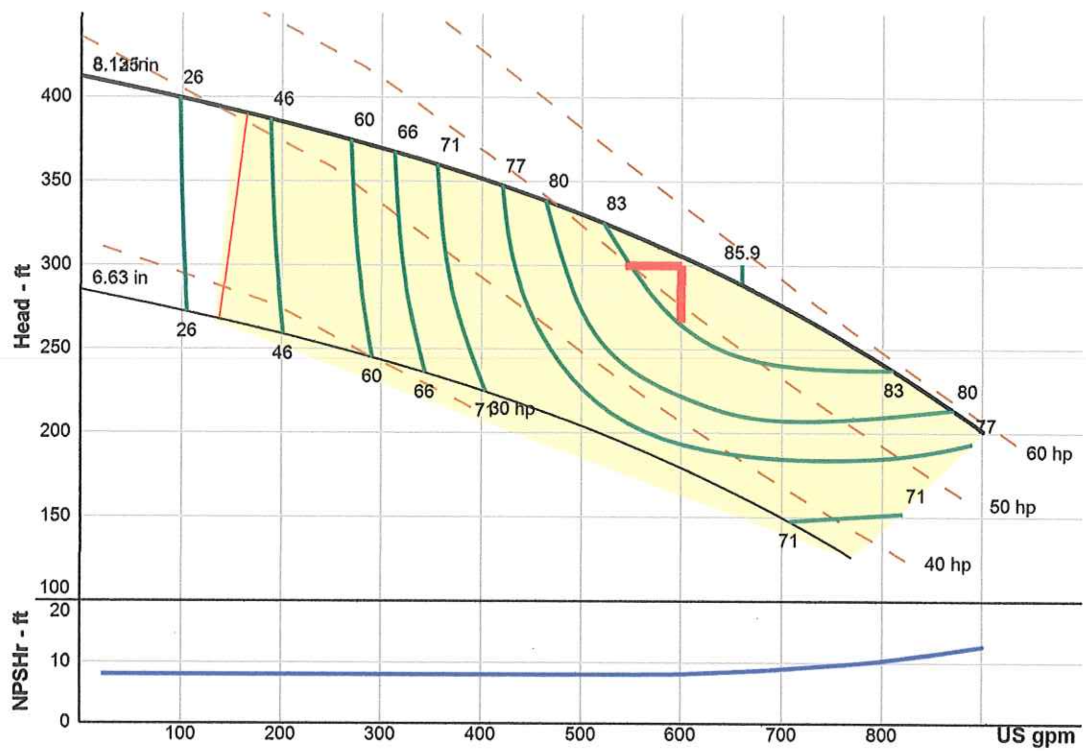
--- Design Curve ---

Shutoff Head:	413 ft
Shutoff dP:	179 psi
Min Flow:	165 US gpm

BEP: 85.9% @ 660 US gpm
NOL Power:
58.9 hp @ 858 US gpm

--- Max Curve ---

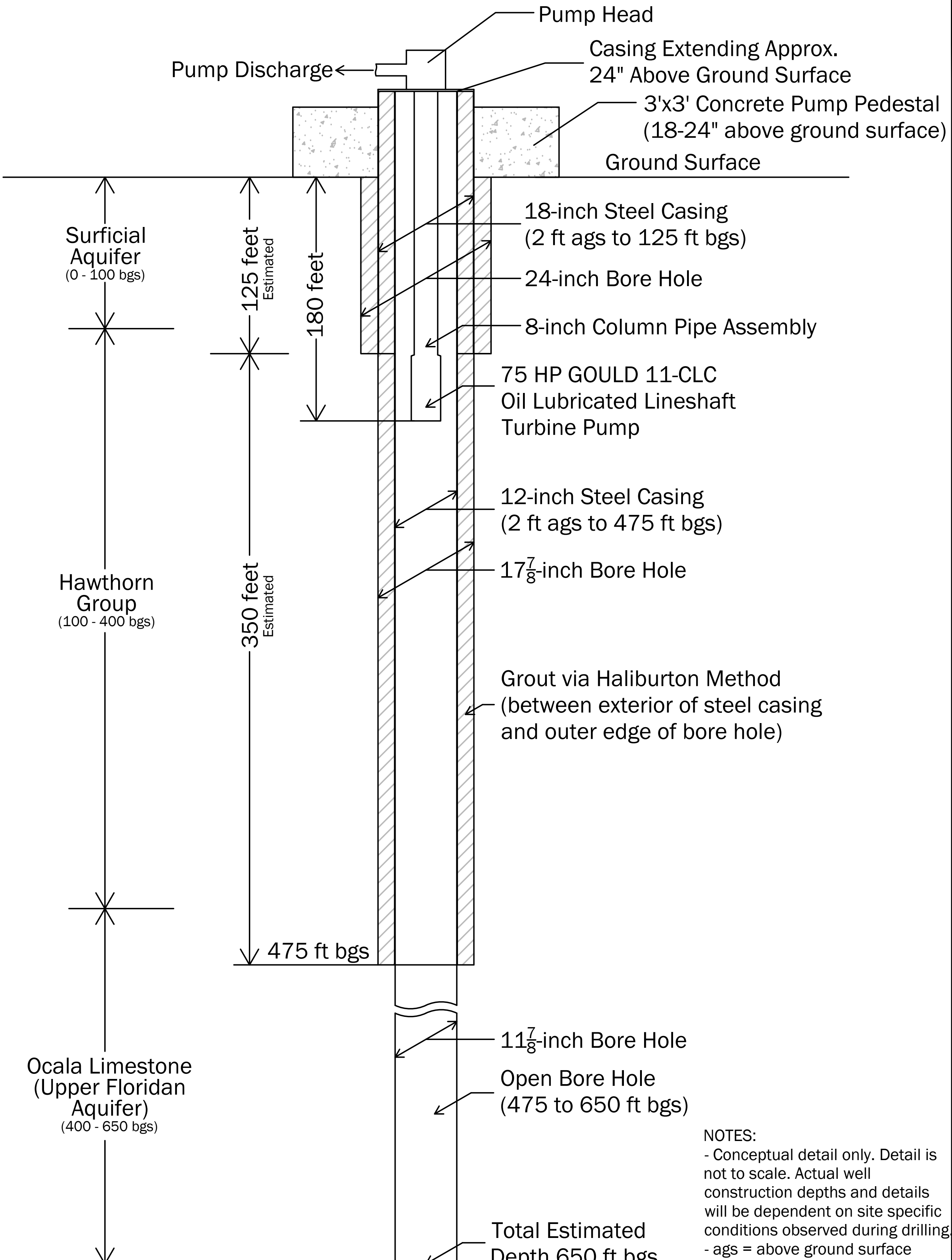
Max Power:
58.9 hp @ 858 US gpm



Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
720	1770	270	85.5	57.4	9.21
600	1770	306	85.3	54.3	8.14
480	1770	335	81	50.2	8.01
360	1770	359	71.5	45.7	7.99
240	1770	380	55.3	41.6	7.99

Selected from catalog: Xylem.TTO.Goulds Lineshaft.60, Vers 4.1



NOTES:
- Conceptual detail only. Detail is not to scale. Actual well construction depths and details will be dependent on site specific conditions observed during drilling
- ags = above ground surface
- bgs = below ground surface

TTL

3516 Greensboro Avenue | Tuscaloosa, AL 35401
205.345.0816 | www.ttlusa.com

FLORIDAN AQUIFER PUMPING

TWIN PINES MINERALS, LLC
SAUNDERS DEMONSTRATION MINE (ID NO. 2073)

ST. GEORGE, CHARLTON COUNTY, GEORGIA

Drawn By: D E K
Checked By: J M T
Date: 04/20/2022
Proj. No.: 18-02-00804.00
File Name: Well_Detail.dwg

Sheet Title
PUMPING WELL DETAIL

California Ground Water Association

Motherlode Branch • 1660 Old Airport Rd •

Auburn, CA 95602 • (530)823-0354

Cement Head Seal Standard

I. Background

The water well industry in California is well familiar with the dictate of DWR Bulletin 74- 81/90 for a 2 inch annulus in all residential and public wells. However, this mandate changed in 2008 with the publication of the new Water Works Standards in California Code of Regulations. Title 22, Chapter 16, Article 3, Section 64560 (c), calls for all "public" and "community" water wells to meet both the bulletin 74 – 81/90 and AWWA 100-6 standard. The latter was changed in 2006 to require a 3 inch annulus, instead of 2 inch, unless a "cement tube" or "the Halliburton Method" was used (see AWWA100-6, Section 4.7.8.3). In these cases the annulus may be reduced to 1 ½ inches.

AWWA 100-6, however, failed to define either what a "cement tube" is or the "Halliburton Method." Appendixes C.3 and C.4 describe the "center of the casing method" of sealing which appears to be what is intended by AWWA's use of the term "Halliburton Method." However, Halliburton Inc. itself employs many different methods for "cementing **oil** wells," most of which are inapplicable to water wells. Moreover, Halliburton Inc., up until recently maintained a company policy of not sealing water wells. AWWA 100-6 itself disclaims appendices C.3, C.4, and C.5 from being part of the standard. Since public wells in California must comply with both AWWA 100-6 and Bulletin 74- 81/90, the minimum annuluses are 2 inches even with a "center of the casing method."

II. Grouting Method

Correspondence from Ernie Williams, chairman of AWWA Wells Standard Committee, provides some clarification by describing a grouting method where sealing material is pushed through the center of the casing around the open bottom and forced up into the annulus. Williams states "in this case, a smaller annular space is allowed (by the AWWA Water Well Committee), because, there is no need to set a tremie pipe in the annular space..." Williams goes on to say that in "the Halliburton Method...the cement is pumped into the well casing at the top of the well and then, using plugs, pushed downward out of the well casing and upward through the annular space."

Typically in the "Halliburton Method" a double plug is used. The first plug is initially placed on the top of the water or drilling fluid inside the well casing (*see figure 1*). Then the top of the well casing is sealed (with the "cement head") and cement is pumped into the well. As cement is pumped, the plug between the underlying fluid and the overlying cement is pushed downward. "The volume of cement pumped into the well is carefully controlled to meet the volumetric requirement of the annular space. Once that volume is pumped, the top of the well is reopened and a second plug is placed on top of the cement. The top of the well is resealed and water is pumped on top of the second plug pushing the cement downwards until both of the plugs reach the bottom of the well casing." At that point, the cement should be entirely or "almost entirely" evacuated from inside of the well casing.

In this process the cement is displaced downward through the inside of the well casing and then pushed upward through the annular space. After the cement has hardened, both of the plugs are drilled out of the well casing and drilling of the rest of the well proceeds.

Mr. Williams then goes on to allow that the same thing could be accomplished with a single plug (s*ee figure 2*). Here, the desired amount of cement or sealing material is placed inside the casing and a plug is sent down on top of the sealing material by pumping water over the top of the plug until the plug reaches the bottom of the casing and the sealing material emerges at the top of the well annulus.

Regarding the "cementing tube method," Mr. Williams makes clear that AWWA's reference to a "cement tube" is not the same as what the industry considers a "tremie" inside the annulus. A cement tube is a pipe that goes down the center of the casing to a "float shoe" attached to the bottom of the casing (s*ee figure 3*). This "cement tube" then becomes the conduit for sealing material, which flows through the float shoe, until the sealing material emerges at the top or the desired amount of sealing material is pumped. The check valve (float) in the float shoe prevents the sealing material from flowing backwards into the center of the well casing. Once the sealing material hardens, the float shoe is drilled out of the bottom of the casing and drilling to depth continues.

III. Discussion

While seemingly straightforward, for those not acquainted with water well construction the practice of these sealing methods presents significant challenges for those actually drilling water wells and installing annular seals every day.

First, the addition of an extra inch of annulus is not particularly onerous when constructing wells in the Sacramento Valley and other alluvial formations. Drilling large diameter holes is a regular feature of mud rotary and reverse rotary drilling techniques used in these formations. However, for those drilling in hard rock, the necessity to increase the bore diameter of the sealing interval in a 6 inch well from 10 inches to 12 inches, and in an 8 inch well from 12 inches to 14 inches, can require not only additional time and expense, but also the possibility of lost circulation. In air rotary drilling, increasing bore diameter results in a lower up-hole "air velocity." When up-hole air velocity declines, the hole does not clean and the possibility of collapse becomes a probability. This then requires adding more air, usually in the form of additional compressors. Because of this many water well contractors are discouraged from undertaking public wells and the people needing them are discouraged by the cost of doing them.

So to avoid the extra annulus, drillers must revert to a "through the center of the casing method" of introducing sealing material. (We refrain here from using the term "Halliburton Method" since Halliburton itself doesn't know what this is. In its place we will use the term "Cement Head Method" for reasons that will be apparent below.)

The description of "through the center of the casing" sealing methods that AWWA sets out in Appendices C.4. and C.5, of AWWA 100-6, present a number of practical problems:

1. The "cement tube/float shoe method", (C.5.) is made difficult by the fact that most float shoes are manufactured by oil field service companies and sold by them only as a part of their oil field services. However, a homemade "float shoe" may be fairly easily made using plywood discs encapsulating a reverse thread female adapter (s*ee figure 3*).

2. Considering the "plug method" of introducing a seal "through the center of a casing", the double plug method is impractical because it assumes an exact calculated volume of sealing material. This is difficult to arrive at in relatively short, top of the hole cementing jobs used in the water well business for the following reasons:

a. The bore of the annulus is often irregular, making a calculated volume difficult, if not impossible, to determine with the type of precision necessary to ensure the double plug cement head seal will fill the annulus. The actual volume is always going to be greater, sometimes significantly so, than the calculated volume because of blowouts and hourglasses in the bore wall. This is especially so with air rotary drilling, where significant hour glasses may be present in the borehole profile, doubling sometimes tripling the volume of sealing material necessary. In the oil field this is not a problem, since installing a 1,000 or 2,000 foot cementing job usually happens in bore holes that are pretty uniform. Moreover, in the long seals found in the oil field, one isn't concerned if the seal comes up 10 or 20 feet short. In public water wells, however, where seals are predominately 50' BGS to the surface, most regulatory authorities would not accept a seal that did not come to the surface.

b. A batch of cement or slurry pumped by regular commercial line pumpers cannot be metered very easily or inexpensively. One can attempt to compute the volume of the pumper's hopper then count the hoppers. But most seals are introduced continuously making this impractical. Pump strokes can be counted, but this can be tedious and inaccurate as well. While Halliburton does have the ability to measure cement volume through a precise proprietary meter, that sort of capability is not available on the equipment used by most water well drillers.

IV. Recommendation

AWWA 100-6 sets out five annular seal installation methods in its appendices even though it makes clear these are not part of the standard:

C.1 Annular Tremie Pour Method

C.2. Annular Tremie Pump Method

C.3 Interior Drop Pipe Without a Plug Method

C.4. Single Plug Method without a Drop Pipe

C.5. Float Shoe Method

C.1. and C.2. are already methods common in the industry and require a 3 inch annulus as a result of the AWWA 100-6 and the 2008 CCR Waterworks revision. C.3. and C.4.are cement head methods and the subject of this standard. C.5. is also practical where affordable commercial float shoes are available or where a driller follows a simple do-it-yourself design.

Interior Drop Pipe without a Plug Method (C3)

AWWA describes the "Interior Drop Pipe without a Plug Method," as follows:

"Grout shall be placed in the annulus by pumping grout down a drop pipe installed inside casing, forcing it out the bottom of the casing and up to ground surface outside the casing. The drop pipe shall extend airtight, through a sealed cap *(cement head)* on the casing head of the well casing to a point no more than 5 ft. above the bottom of the casing."

This is a most practical and effective method of installation in that it allows the driller to pump a quantity of sealing material determined empirically by the amount required to bring evidence of the sealing material to the surface of the annulus. The only calculation required is in placing an order at the batch plant. For those who batch their own sealing material or use a volumetric batcher, even this calculation is not necessary.

Using a drop pipe eliminates wastage since the sealed cement head makes the casing a closed cylinder filled with water and some air that does not allow sealing material to rise in the casing once the annulus is filled.

However, in this method the drop pipe can be eliminated if the driller is willing to waste the volume of sealing material that will set up inside the casing eventually to be drilled out. If the driller does not use a drop pipe it is advisable to chase the sealing material pumped with a measured volume of water, 90% of the volume of the casing or conductor casing. This will cut down on the sealing material drill out after setup (*see Figure 4*).

Single Plug Method without a Drop Pipe (C4)

This method is identical to the Drop Pipe Method except that the drop pipe is eliminated and a drillable plug is placed in the cement head to separate the water pumped to chase the sealing material when color is witnessed in the annulus. Again the volume so sealing material left in the casing is wasted (*see Figure 2*).

Center Cement Tube method (Float Shoe Method, C5)

This is a through-the-center-of-the-casing sealing method where a cement tube is sent down the interior of the conductor casing. Commercially available shoes are supplied by Gemco and Western Rubber. These have a check valve that allows grout to be pumped down through the cement tube, out the nose of the float shoe, around the outside of the conductor casing and up to the surface, thus installing the annular seal. Once the seal is set up the cement tube is removed usually with a clockwise rotation of the tremie pipe in a reverse threaded female fitting in the float shoe, and the float shoe is drilled out to continue drilling the hole to total depth.

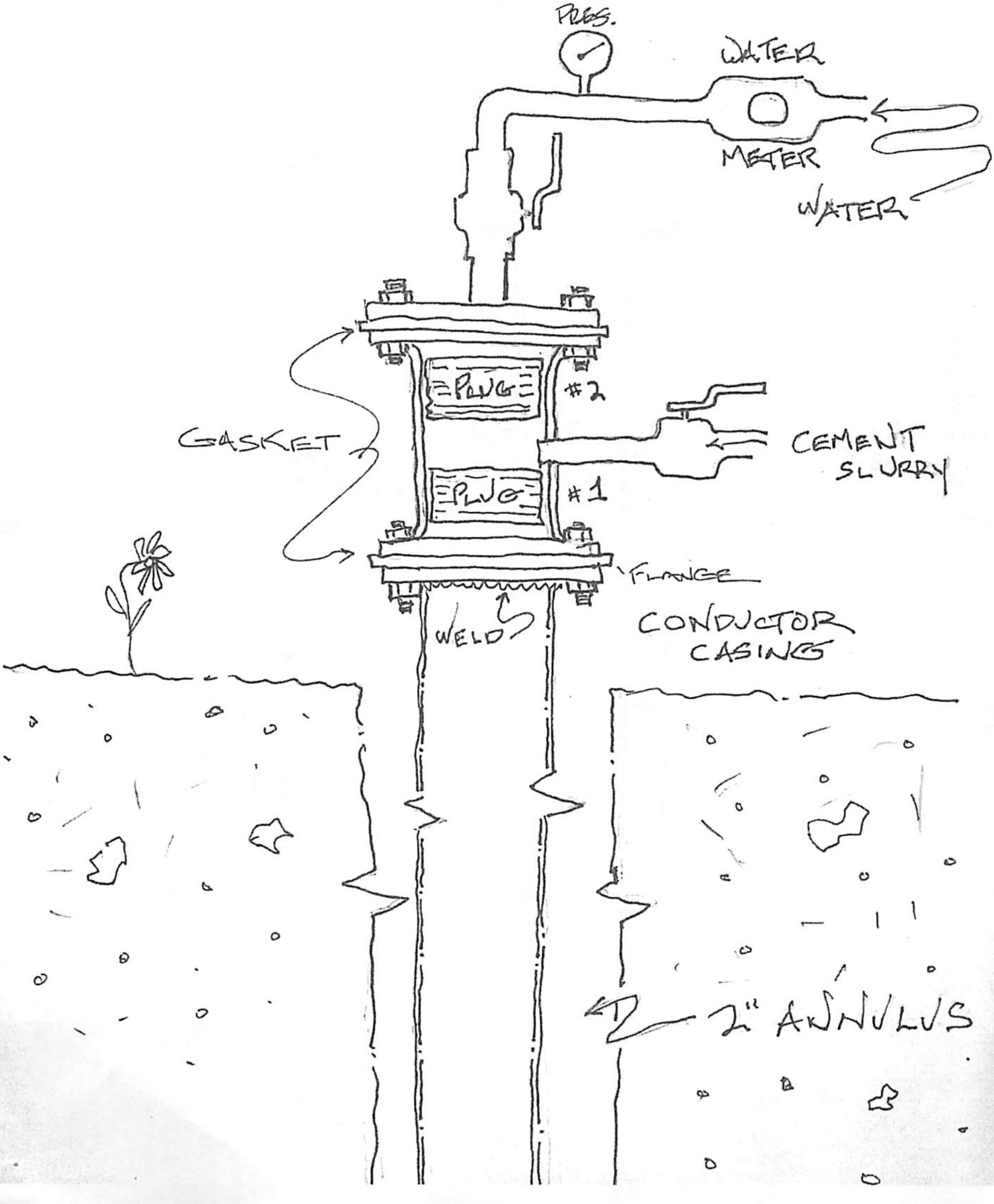
In place of the commercially available float shoe, a driller may fabricate a "Maggiora" do-it-yourself float shoe embedding a reverse threaded fitting in series of glued-together plywood disks with a hole through the center (*see Figure 3*). Here the "Maggiora" do-it-yourself float shoe is placed inside of a casing coupler which is then attached to the bottom of the conductor casing. Since the "Maggiora" do-it-yourself float shoe has the inside diameter of the coupler and therefore is a little bit larger than the ID of the conductor casing, it will stay positioned in the coupler throughout the casing installation operation. Once in place the grout material of choice is pumped through the cement tube. When the grout appears in the annulus at the surface, a column of water 90% of the volume of the cement tube itself is sent down. This clears the cementing tube of cement and makes for easy removal after the sealing material is set. Thereafter, the cement tube is removed once the float shoe is drilled out.

Guidelines to follow in placing cement head seals are as follows:

1. Cement head seals invariably require sealing in a conductor casing unless consolidated formation is encountered before the sealing interval is reached and open hole air rotary drilling is possible after that.
2. The conductor should be made of steel with a wall thickness of at least 0.188”.
3. Borehole diameter in the sealing interval must be the outside diameter of the conductor casing plus 4”.
4. Welds on cement head/conductor flange should be good to avoid the cement head becoming a rocket.
5. The conductor casing should be installed with side windows, a mules-foot, or both, to allow the free flow of pumped sealing material around the bottom of the conductor, unless the C.5. Cement Tube Method is used.
6. If an interior cement tube is used, it should be PVC so that it can be drilled out if it does not pull or unscrew after the seal is set.
7. Prior to injection of sealing material, water should be pumped through the cement head until it emerges at the surface of the annulus. This will clear all obstructions in the annulus.
8. Cementitious sealing materials should be pre-batched and brought to the drill site. Experience has demonstrated that volumetric batches mixed on site and immediately pumped do not have the pumpability of premixed batches. However, where batch plants cannot be relied on to reproduce a recipe accurately, volumetric mixers may be preferred.
9. A slurry mix design should be used that ensures pumpability and impermeability (see CGA Sealing Material Standard). The water ratio on a 10.3 sack mix should approach or exceed 7 gallons per sack.
10. Once color emerges from the annulus (sealing material) cement valves should be closed to prevent backflow until a cleansing shot of water is pumped.
11. After sealing material is pumped, a volume of water should be pumped that equals 90% of the interior cementing tube is used, or 90% of the conductor casing if a cement tube is not used.
12. A sample of the slurry should be taken and submerged in water to serve as an indicator of when the sealing material has set.
13. After sealing material has set, presumably 24 hours, the cement head is removed, the interior cementing tube (if used) is pulled and borehole drilling resumed. This will entail drilling out set up sealing material in the conductor casing, and/or the drillable plug at the bottom of the sealing interval. If the interior cement tube method is used. It entails cranking clockwise on the cement tube to remove it and resuming drilling after the plug the ersatz float shoe is drilled out.

DOUBLE PLUG CEMENT HEAD

FIG. 1



SINGLE PLUG CEMENT HEAD

FIG. 2

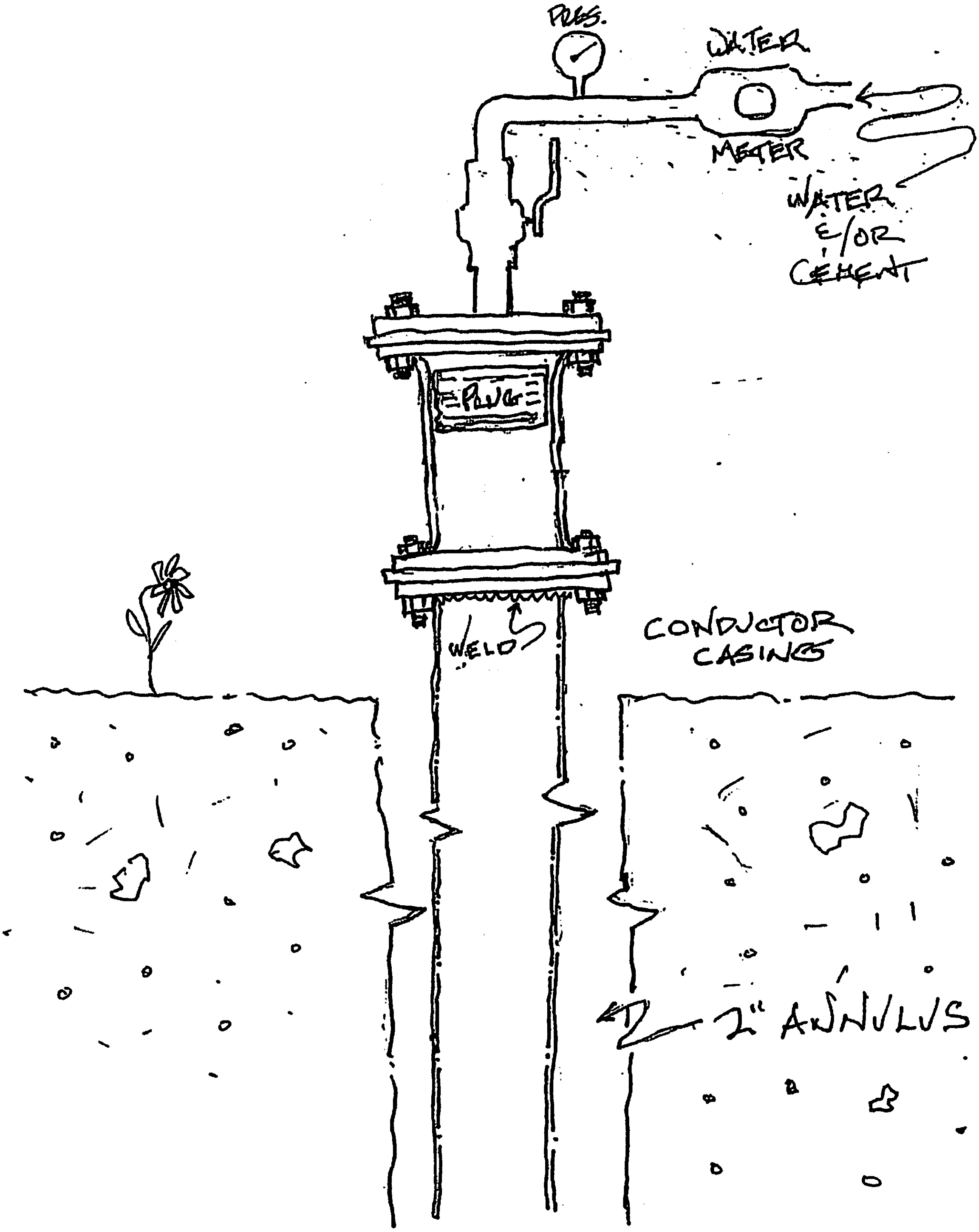


FIGURE 3

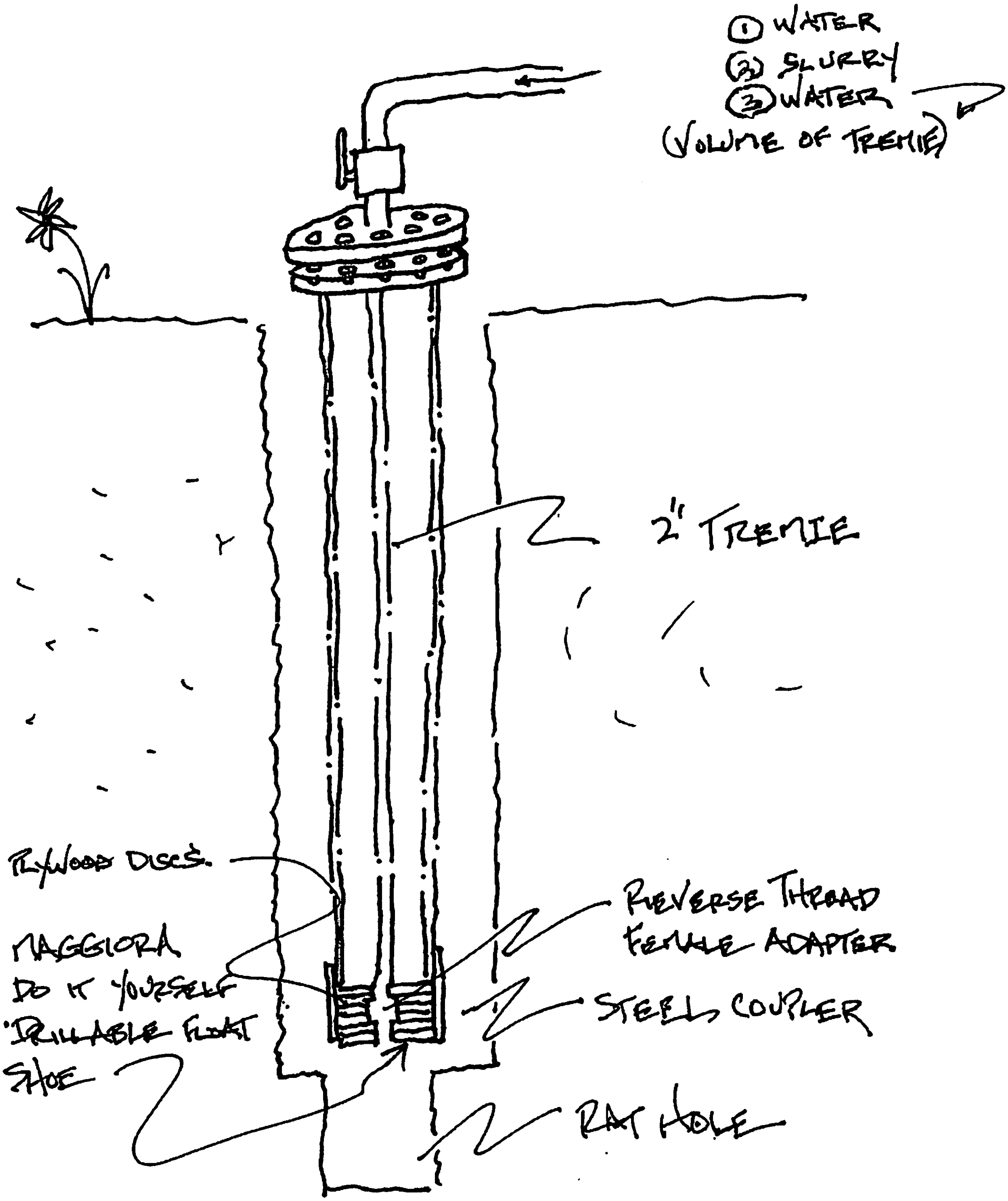
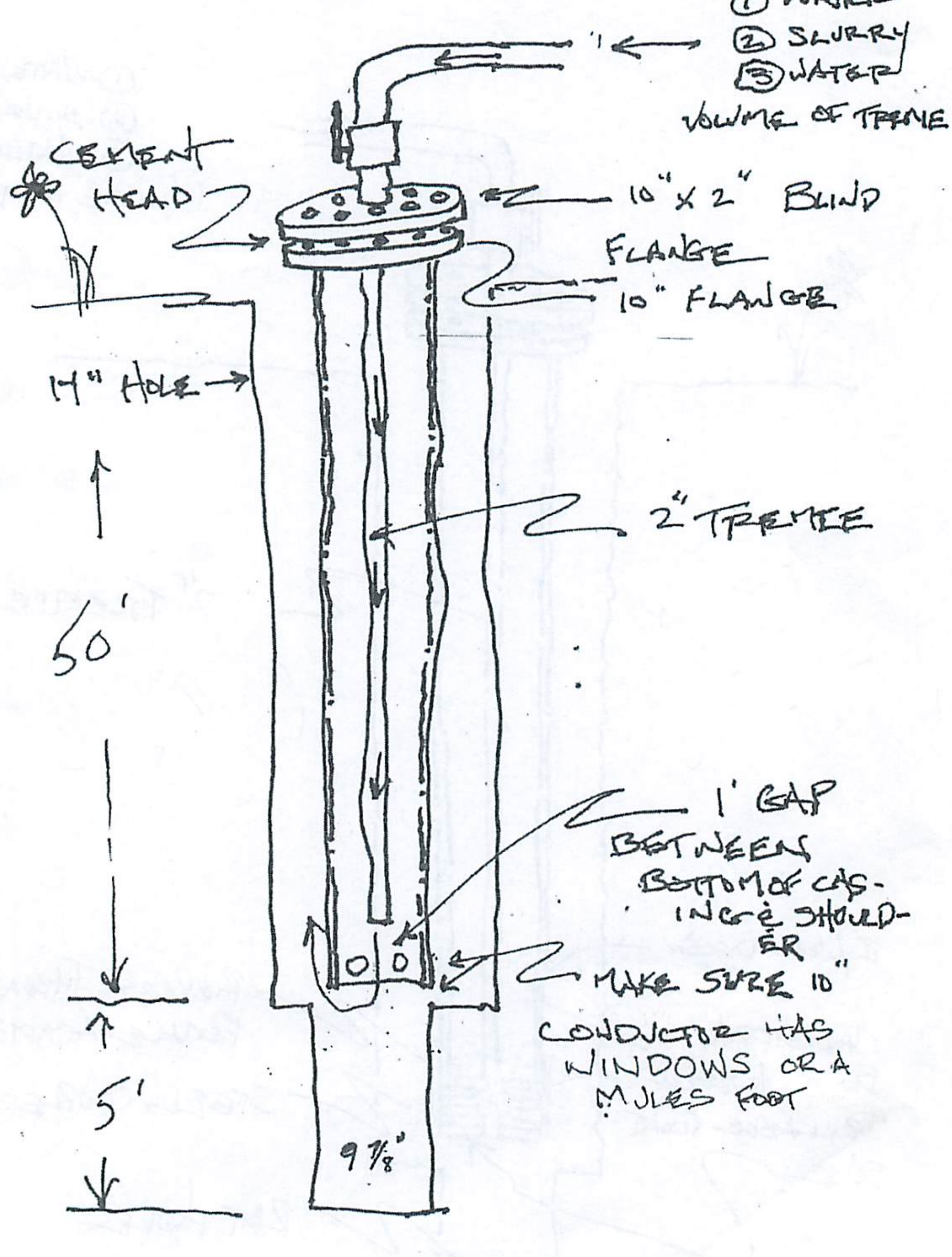

① WATER
② SLURRY
③ WATER
(VOLUME OF TREMIE)
2" TREMIE
PLYWOOD DISCS.
MAGGIORA
DO IT YOURSELF
DRILLABLE FLOAT
SHOE
REVERSE THREAD
FEMALE ADAPTER
STEEL COUPLER
RAT HOLE

FIGURE 4



① WATER
② SLURRY
③ WATER
VOLUME OF TREMIE
CEMENT HEAD
10" x 2" BLIND FLANGE
10" FLANGE
14" HOLE
2" TREMIE
50'
1' GAP BETWEEN BOTTOM OF CASING & SHOULDER
MAKE SURE 10" CONDUCTOR HAS WINDOWS OR A MULES FOOT
5'
9 7/8"